

REMARKS

Claims 1, 8, 9, 13, 15 and 18 are now in the application. Claim 1 has been amended to recite "A cation electrocoating method comprising: pre-treating a substance comprising an iron material at least in part by employing a chemical conversion coating agent comprising" in place of "chemical conversion coating agent for use in pretreatment of cationic electrocoating for a substance to be treated, at least a part of which comprises an iron material, consisting of" in order to more explicitly include recitations, that were in the claim preamble, to be present in the body of the claim. Claim 1 was also amended to recite "water rinsing the pretreated substance and applying a cation electrocoating". Claim 8 was amended for consistency in view of the amendment to claim 1. Claims 13 and 15 were amended to render them dependent upon claim 1. Claim 18 was amended for consistency in view of the amendment to claim 15. The amendments to the claims do not introduce any new matter.

Claims 1, 8 and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3,964,936 to Das in view of WO01/48264 to Sako and further in view of US Patent 4,287,041 to Tominaga et al. and US Patent 5,089,101 to Hayashi et al. Claims 13, 15 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3,964,936 to Das in view of WO01/48264 to Sako and further in view of US Patent 4,287,041 to Tominaga et al. and US Patent 5,089,101 to Hayashi et al. and US Patent 5,449,415 to Dolan. The cited references do not render obvious the present invention.

The present invention as recited in the claims as amended relates to a cation electrocoating method that as pre-treatment before applying a cation electrocoating method, a chemical conversion coat is formed on a metal substance, followed by water rinsing and then the cation electrocoating method is carried out. The chemical conversion coating is formed by employing a chemical conversion coating agent which contains at least one kind selected from the group consisting of zirconium, titanium and hafnium; and fluorine, but contains substantially no harmful heavy metal ions such as chromium. When a substance comprising an iron material is treated by a zirconium-containing chemical conversion agent, it is considered that the hydroxide or oxide of zirconium is deposited on a surface of the substance because metal ions elute in the agent through a dissolution reaction of the metal and pH at an interface increases. Please see page 5, lines 7-16 of the specification.

The chemical conversion coating agent of the present invention contains a water-soluble epoxy compound that when blended in the agent, an affinity for the resin in a coating composition is increased by an epoxy skeleton. Therefore, the adhesion to coating films is enhanced and the coating can exhibit good stability. Please see page 7, lines 14-20 of the specification.

The water-soluble epoxy compound is not particularly limited as long as it has sufficient solubility so that it can dissolve a required amount in a chemical conversion coating agent, and a compound including an epoxy resin as a skeleton may be used. Please see page 7, lines 21-25 of the specification.

Preferably, the water-soluble epoxy compound has an amino group as recited in the claims. Such a water-soluble epoxy compound is a cationic compound and adjusts the balance between hydrophilic and hydrophobic properties, therefore it has a property of becoming insoluble and precipitating when the pH of an aqueous solution increases. Therefore, the epoxy compound becomes prone to precipitate on the surface of the substance due to an increase of a pH in an interface between iron and an aqueous solution. As a result of an analysis by X-ray photoelectron spectroscopy, it became apparent that the above water soluble epoxy compound having an amino group is precipitated on a chemical conversion coat comprising at least one kind selected from the group the group consisting of zirconium, titanium and hafnium. It is estimated that the resulting chemical conversion coat has such a structure, thereby improving the adhesion. Please see the paragraph bridging pages 7 and 8 of the specification.

Namely, when a substance comprising iron according to the present invention is immersed into a chemical conversion agent controlled in the specific range of pH, an epoxy compound having amino group readily precipitates on a surface of the substance, and an epoxy compound having amino group and having isocyanate group is precipitated on a coating film comprising zirconium and the like. Therefore, it is estimated that such an epoxy compound having amino group having the aforementioned structure improves its adhesion. As the epoxy compound having a (blocked) amino group has isocyanate group, a urethane crosslinking reaction occurs by reacting the isocyanate group with the epoxy compound or active hydrogen in a cation electrocoating so that a tough electrocoating film is formed and also improves adhesion to the film.

As explained above, by conducting a pretreatment of a substance comprising an iron material using a chemical conversion agent of the present invention, it is possible to achieve a cation electrocoating to form a coating film showing excellent results through Secondary Adhesion Test and Combined Cycle Corrosion Test. Please see page 32, line 20 and page 33, line 2, respectively, of the specification.

Das fails to render obvious the present invention since, among other things, as appreciated by the Examiner, Das does not teach an organic resin comprising an epoxy compound having an isocyanate group. In fact, Das nowhere discloses any of the water-soluble epoxy compounds according to the present invention. Moreover, Das suggests a chemical conversion coating agent that is merely for use on aluminum, not for use on a substance to be treated which comprises an iron material at least in part as recited in the present claims. The present invention relates to forming a chemical conversion coat on a surface of a substance comprising an iron material at least in part through a chemical reaction of a chemical conversion agent with a surface of the substance; thereby resulting in the improved adhesion. Das fails to suggest the present invention since Das employs only an aluminum substance

Sako does not overcome the above discussed deficiencies of Das with respect to rendering unpatentable the present invention. Sako suggests a cation modified epoxy resin "ADEKARESIN" and using an isocyanate crosslinking agent. It is, however, noted that Sako nowhere discloses "the amino group containing water-soluble epoxy compound having an isocyanate group" defined in the presently claimed invention.

Tominaga et al. and Hayashi et al. do not overcome the above discussed deficiencies of Das and Sako with respect to rendering unpatentable the present invention. Tominaga et al. and Hayashi et al. were relied upon for disclosure of a partially blocked polyisocyanate curing agent. However, Tominaga et al. and Hayashi et al. fail to teach "the water-soluble epoxy compound having an isocyanate group" defined in the presently claimed invention.

With respect to claims 13, 15 and 18, the Examiner stated that Das does not teach the claimed amount of hydrogen peroxide. Dolan does not overcome the above discussed deficiencies of Das with respect to rendering unpatentable the present invention. Dolan was relied upon for disclosure of a chromium-free conversion coating composition that can contain hydrogen peroxide in the claimed amounts as an oxidizing agent. Dolan suggests a chemical

conversion coating agent containing hydrogen peroxide not containing chromium. It is, however, noted that Dolan nowhere disclose “the water-soluble epoxy compound having an isocyanate group” defined in the presently claimed invention.

Furthermore, none of the cited references suggest the advantageous results achievable by the present invention and discussed above. For reasons mentioned above, it is noted that Claims 1, 8, 9, 13, 15 and 18 would not be rendered obvious over the cited references.

The mere fact that the cited art may be modified in the manner suggested in the Office Action does not make this modification obvious, unless the cited art suggest the desirability of the modification or there is well reasoned and articulated rationale. This is not present in the present record. The Examiner's attention is kindly directed to *KSR Int'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727; 82 USPQ2d 1385 (2007), *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002), *In re Dembiczak et al.*, 50 USPQ 2d. 1614 (Fed. Cir. 1999), *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), *In re Laskowski*, 10 USPQ2d. 1397 (Fed. Cir. 1989) and *In re Fritch*, 23 USPQ2d. 1780 (Fed. Cir.1992).

Also, the cited art lacks the necessary direction or incentive to those of ordinary skill in the art to render a rejection under 35 USC 103 sustainable. The cited art fails to provide the degree of predictability of success of achieving the properties attainable by the present invention needed to sustain a rejection under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc.*, *supra*, *Diversitech Corp. v. Century Steps, Inc.*, 7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 187 USPQ 774 (CCPA 1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1966).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *KSR Int'l Co. v. Teleflex, Inc.*, *supra*; *Gillette Co. v. S. C. Johnson & Son, Inc.*, 16 USPQ2d 1923 (Fed. Cir. 1990), *In re Antonie*, 195 USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ 519 (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited an. Along these lines, see *In re Papesch*, *supra*, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).

CONCLUSION

In view of the above, consideration and allowance are respectfully solicited.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

The Office is authorized to charge any necessary fees to Deposit Account No. 22-0185, under Order No. 27620-00003-US from which the undersigned is authorized to draw.

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Respectfully submitted,

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